

# **Statewide Urban Bus Standards and Fleet Rule for Transit Agencies in South Coast Air District**

## **Public Workshop**

**April 27, 2005 - Sacramento  
1:00 - 4:00 PM**



# E-mail Comments During Workshop

- [onair@arb.ca.gov](mailto:onair@arb.ca.gov)
- Subject Heading: Urban Bus
- Only available during workshop (1-4pm)

# Why Reduce Diesel Emissions?

- Diesel Engines are Long Lived
- NO<sub>x</sub> is an Ozone Precursor
- Diesel PM is a Toxic Air Contaminant

# Health Impacts of Diesels in California

- Annual health impacts
  - 2,900 premature deaths
  - 3,600 hospital admissions
  - 240,000 asthma attacks/respiratory symptoms
  - 600,000 lost days of work
- By comparison
  - 3,700 deaths from car accidents
  - 2,000 homicides

# **What Vehicles Are We Talking About?**

# Urban Bus

- Passenger Carrying Vehicle
- Powered by Heavy Heavy-Duty Diesel Engine or of a Type Normally Powered By a Heavy Heavy-Duty Diesel Engine
- Load Capacity of 15 or More
- Fixed Route/Intracity Operation
- Generally 35+ Feet in Length
- Owned/Operated by a Transit Agency

# Transit Fleet Vehicles

- Passenger Carrying Vehicle or Non-Revenue Vehicle
- Vehicle Greater than 8,500 GVWR
- Powered by Heavy-Duty Engine
- Diesel and Alternative-Fuels
- Owned/Operated by a Transit Agency
- Not an Urban Bus

# Current California Programs

- Heavy-Duty Truck Engine Standards
- UB New Engine Standards
- UB Fleet Purchasing, Fuel, and Emission Reduction Requirements
- TFV Fleet Emission Reduction Requirements



# Heavy-Duty Truck New Engine Standards

Emission Standards (g/bhp-hr)		
Model Year	NOx	PM
1988	6.0	0.6
1990	6.0	0.6
1991	5.0	0.25
1994	5.0	0.10
1998	4.0	0.10
October 2002	2.2 <sub>(1)</sub>	0.10
2004	2.2 <sub>(1)</sub>	0.10
2007	1.2 <sub>(2)</sub>	0.01
2010	0.2	0.01

(1) Nominal NOx based on 2.4 g/bhp-hr NMHC+NOx or 2.5 g/bhp-hr NMHC+NOx with 0.5 g/bhp-hr NMHC cap.

(2) Approximate value based on averaging.

# Urban Bus

## New Engine Standards

- Oct. 1, 2002: 0.01 g/bhp-hr PM
- 2004-2006: 0.5 g/bhp-hr NOx
  - Diesel, Dual fuel, Bi-fuel
- 2004-2006: 2.4 g/bph-hr NOx+NMHC or optional 1.8 - 0.3 g/bhp-hr NOx+NMHC
  - Alternative fuel
- 2004-2006: 1.8 g/bhp-hr NOx
  - Diesel HEB (w/ ARB Purchase Approval)
- 2007+: 0.2 g/bhp-hr NOx

# Urban Bus Fleet Requirements

- Diesel/Alt Fuel Path Selection
- Ultra-low Sulfur Fuel July 2002
- 4.8 g/bhp-hr NO<sub>x</sub> Average October 2002
- Multiple Stage PM Reduction Requirement
- ZEB Demo and Purchase Requirement

# Transit Fleet Vehicle Fleet Requirements

Applies to Transit Fleet Vehicles, not  
Urban Buses

<b>Date</b>	<b>% PM reduction from baseline</b>	<b>Fleet NOx Average</b>
<b>January 1, 2005</b>	<b>0%</b>	<b>na</b>
<b>December 31, 2007</b>	<b>40%</b>	<b>3.2 or retire 1997 and earlier MY</b>
<b>December 31, 2010</b>	<b>80%</b>	<b>2.4 or retire 2001 and earlier MY</b>

# SCAQMD Rule 1192

- Adopted 2000
- Applies to Public Transit Fleets With 15 or More Transit Vehicles
- Alt Fuel Purchase/Lease Requirement Beginning 2001

# Why is the ARB Considering Transit Bus Regulation?

- U.S. Supreme court ruled that certain aspects of Rule 1192 are preempted by federal authority
- ARB and U.S. EPA determined Rule 1192 not appropriate for waiver without state adoption
- ARB agreed to evaluate four fleet rules - including Rule 1192 affecting transit buses

# What Are the Regulatory Concepts for Transit Agencies?

- Statewide
  - Alignment of Urban Bus Standards with HDT Standards in 2007
- South Coast
  - Urban Bus Purchase/Lease Requirement



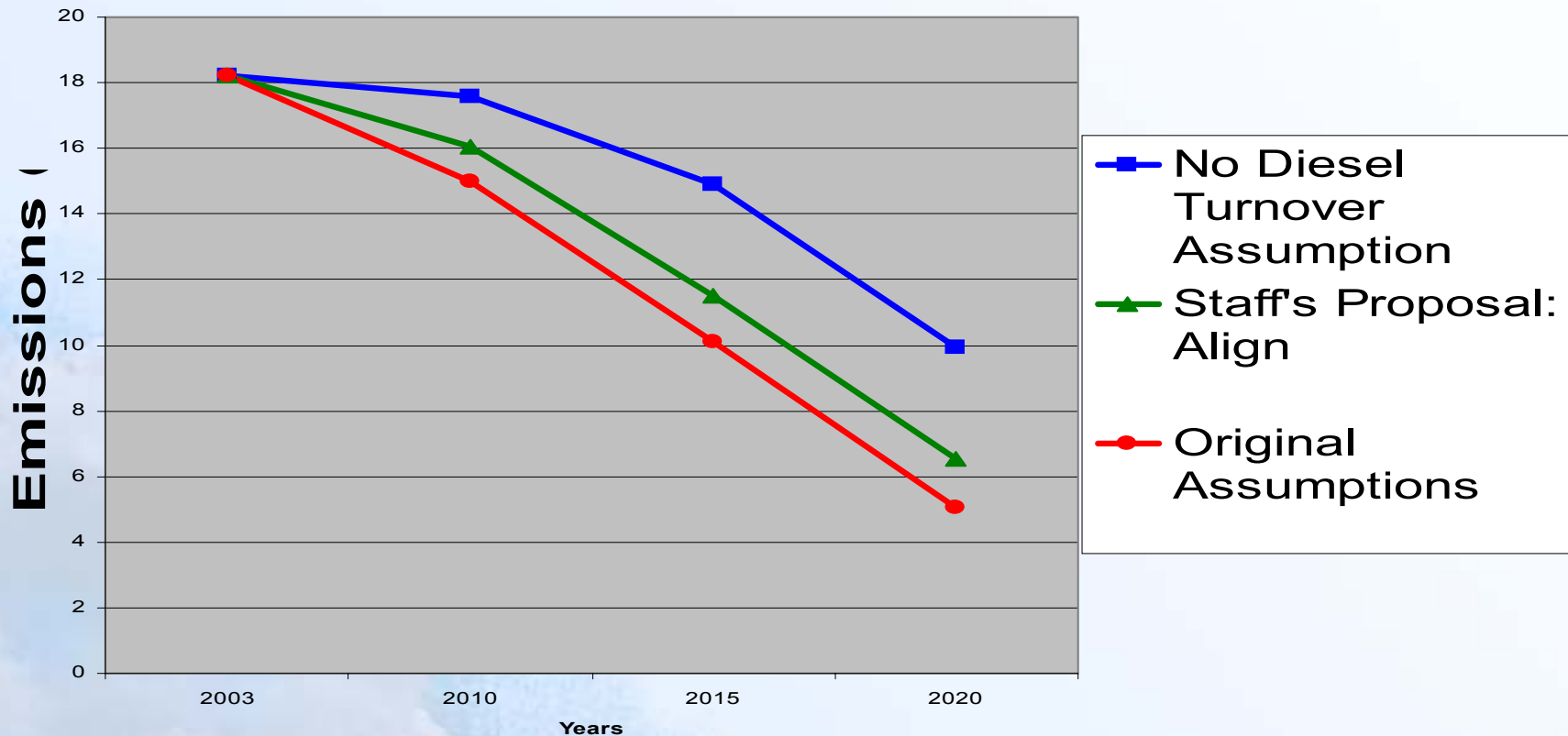
# UB Standard Alignment with HDT Standards: Proposal

- Need for Change
  - No Diesel Buses Available for 2007-2009
  - Keeps the Oldest, Dirtiest Diesel Buses on the Road
- Proposal to Modify Section 1956.1 and 1956.8
  - Harmonize Urban Bus Engine Emissions Standards with California's 2007 HHD Truck Engine Standards



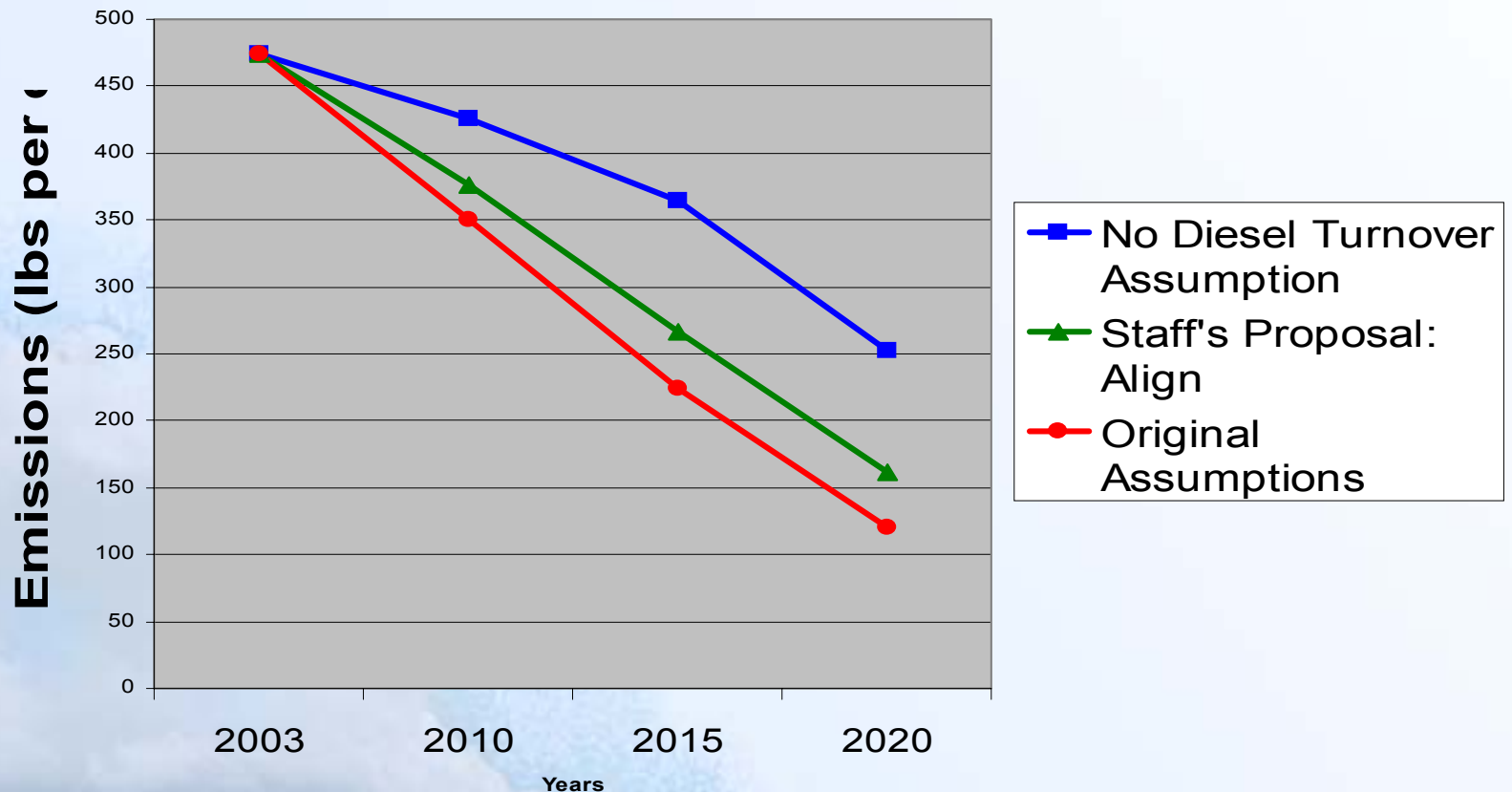
# Recovered Benefits Proposed Rule - Alignment

## NOx Emissions - Urban Buses



# Recovered Benefits Proposed Rule - Alignment

PM Emissions - Urban Buses



# Cost Impacts

- Alignment
  - Lower Cost to Transit Agencies on Diesel Path
  - No Effect for Transit Agencies on Alt Fuel Path

# SC Urban Bus: Proposal

- Applies only to Transit Agencies Operating in the South Coast
- Alternative Fuel Path is Mandatory
- For TA on Diesel Path, Change Applies 1/1/2006.

# **SC Transit Agencies Current Urban Bus Fuel Path Choices**

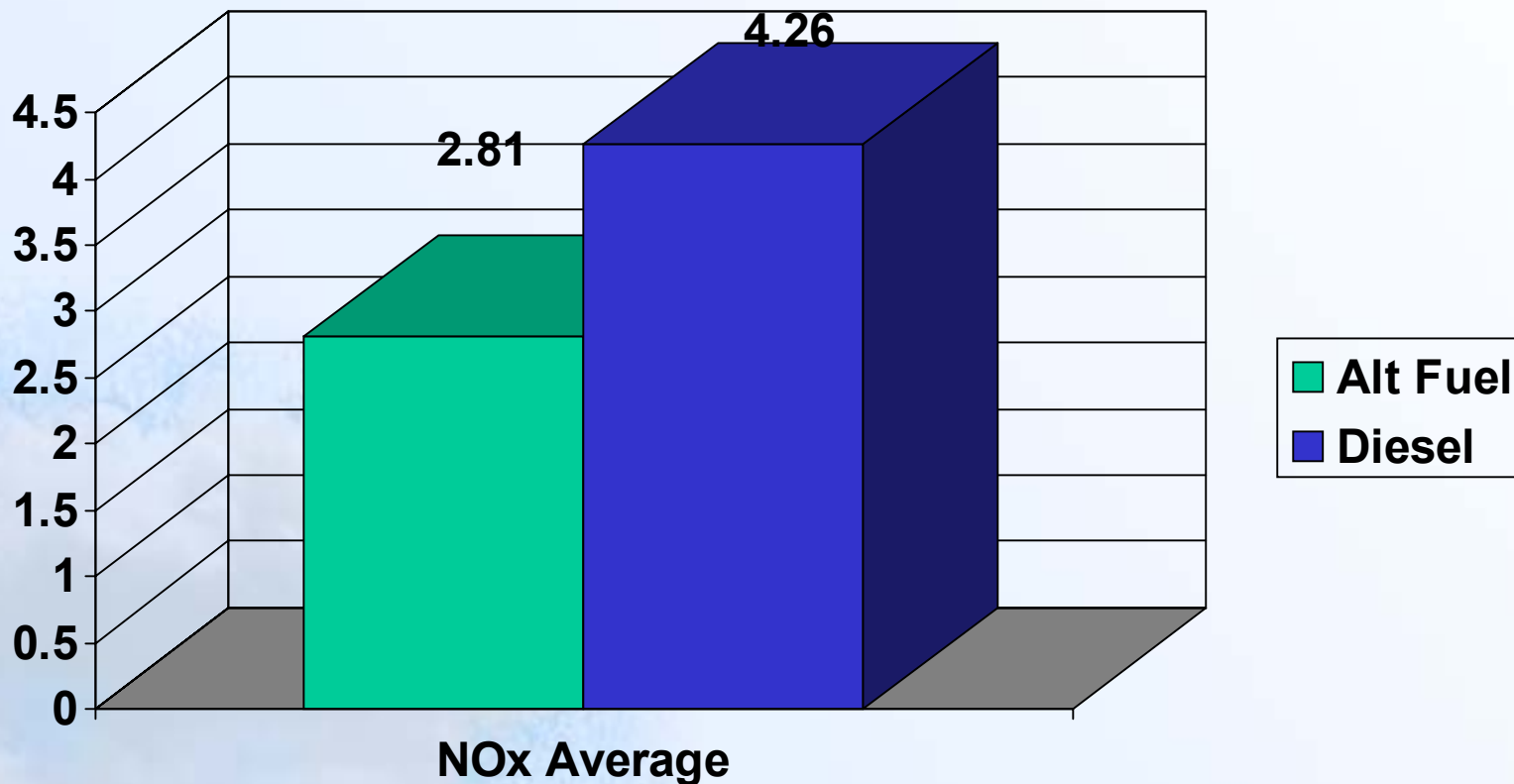
## **Alternative Fuel Path**

**Commerce  
Culver City  
Foothill  
Glendale  
L.A. MTA  
L.A. DOT  
Omnitrans  
Orange County  
Riverside  
Santa Monica  
Sun Line**

## **Diesel Path**

**Gardena  
Long Beach  
Montebello  
Norwalk  
Santa Clarita  
Torrance**

# SC Urban Bus NOx Fleet Averages



# Preliminary NOx Emission Benefits

- SCAQMD Alt Fuel Path
  - Six Transit Agencies Affected
  - 15-30 Buses Turnover Per Year to Alt Fuel (Result of Rule)
  - Estimated 3.65 tpy NOx in 2010

# Preliminary Cost Estimates

- SCAQMD Alt Fuel Path
  - CNG Capital Increment Over Diesel: \$85 to \$100K per Bus
  - BUT Costs Reduced by
    - 80% (diesel) to 83% (alt fuel) FTA Match
    - Incentive Funding
  - CNG O&M Increment Over Diesel: \$16K (Lifetime per Bus)



# No Change Proposed for Transit Fleet Vehicles

- Emission Reductions Obtained Through the Current ARB TFV Rule
- ARB's Rule Achieves Additional Reductions Beyond 1192

# Comparison of Scope of 1192 and ARB Fleet Rule

- 1192
  - 14,000 lbs. GVWR and Above
  - Fleets with 15 or More Vehicles
  - Impacts New Purchases/Leases Only
- ARB Fleet Rule for Transit Agencies
  - 8,500 lbs. GVWR and Above
  - Includes all Transit Agencies
  - Includes all TFV (Paratransit, Non-revenue)
  - Impacts In-use and New Vehicles

# Preliminary TFV: NOx Emissions

## Rule 1192 & ARB's Fleet Requirement

SCAQMD-TFV NOx Analysis Summary					
	# of Transit Agencies	# of Vehicles Affected	# of Alt. Fuel Vehicles	% Alt. Fuel Vehicles in Fleet	Reductions 2004 to 2007
SCAQMD 1192	18	401	261	65.1%	21.2
ARB TFV	55	866	357	41.2%	23.5
		Additional ARB tons/yr:			2.3

# Incentive Funding - Example

- Incentives based on surplus emissions
- No incentives 2007-2009
  - Unless urban bus aligns with truck standards, or
  - Engine certified below 0.2 g/bhp-hr

# Summary

- Align 2007 Urban Bus Engines with 2007 HD Truck Engine Standards
- Transit Agencies in the South Coast Air District Follow Alt Fuel Path
- No Changes to Transit Fleet Vehicle Requirements

# Public Process

- Public Workshops: 04/07/05, 04/27/05
- Comments Requested by 05/04/05
- Staff Report Released by 06/03/05
- Board Hearing 07/21-22/05

# COMMENTS REQUESTED

- E-Mail To:
  - David Salardino, [dsalardi@arb.ca.gov](mailto:dsalardi@arb.ca.gov)
  - Please cc: Nancy Steele, [nsteele@arb.ca.gov](mailto:nsteele@arb.ca.gov)
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